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09/987,345	11/14/2001	Takeshi Konno	107443-00014	6928

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EXAMINER
FONTAINE, MONICA A

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 01/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/987,345	Applicant(s) KONNO, TAKESHI	
	Examiner Monica A Fontaine	Art Unit 1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 9 is rejected under 35 U.S.C. 102(e) as being anticipated by Imatomi et al. (U.S. Patent 6,321,940). Imatomi et al., hereafter "Imatomi," show that it is known to carry out a method for controlling an injection molding machine having a screw arranged within a heating cylinder to be rotatable and to be linearly movable and having a flight with a pitch, the molten resin being moved in a forward feeding direction during a plasticization process and an injection process (Column 5, lines 50-67 – Column 6, lines 31). Furthermore, Imatomi shows a method comprising the step of linearly moving the screw backwards relative to the forward feeding direction of the molten resin and simultaneously rotating the screw in the forward feeding direction, after completion of the plasticization process or the injection process (Column 6, lines 20-31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (U.S. Patent 4,879,077), in view of Imatomi.

Regarding Claim 1, Shimizu et al., hereafter "Shimizu," shows the basic process, including controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, lines 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary synchronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after

completion of the measuring process or the injection process. Imatomi shows that it is known to retract the screw while rotating it (Column 6, lines 20-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards, as in Imatomi, in Shimizu's injection molding process in order to melt and measure the material more efficiently.

Regarding Claim 2, Shimizu and Imatomi show the basic process as claimed as discussed above, but Shimizu does not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 3, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation

speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection process (Column 2, lines 60), comprising the steps of, defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Imatomi shows that it is known to retract the screw while rotating it (Column 6, lines 20-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards, as in Imatomi, in Shimizu's injection molding process in order to melt and measure the material more efficiently.

Regarding Claim 4, Shimizu and Imatomi show the basic process as claimed as discussed above, but does not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 5, Shimizu and Imatomi show the basic process as claimed, including Shimizu's controlling an injection molding machine including a heating cylinder and a screw disposed in the heating cylinder (Column 3, lines 46-47), performing a plasticization/measuring process and an injection process (Column 2, line 60), defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and

linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary sychronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Imatomi shows that it is known to retract the screw while rotating it (Column 6, lines 20-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards, as in Imatomi, in Shimizu's injection molding process in order to melt and measure the material more efficiently. Furthermore, Shimizu and Imatomi show the basic process as claimed as discussed above, but do not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 6, Shimizu and Imatomi show the basic process as claimed as discussed above, but do not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the linear speed of the screw (Column 11, lines 56-64), thus preventing any forward movement of material. Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw, encouraging material to be fed in the forward direction. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 7, Shimizu shows the basic process as claimed, including a process using a heating cylinder, a screw disposed in a heating cylinder (Column 3, lines 46-47), a first driving source for driving the screw in an axial direction, a second driving source for rotating the screw (Column 4, lines 1-5, 18-27), position detecting means for detecting the axial position of the screw (Column 5, lines 42-51), rotation-speed detecting means for detecting the rotation speed of the screw (Column 4, lines 49-54), and a controller for controlling the first driving source and the second driving source dependent on the detecting signals transmitted from the position detecting means (Column 5, lines 47-51) and the rotation-speed detecting means (Column 4, 60-65). Shimizu also shows a plasticization/measuring process and an injection

process (Column 2, line 60), comprising the steps of defining a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and defining a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. The examiner also notes that Shimizu does not explicitly define an arbitrary synchronization ratio, as used in the claimed formula. However, since the arbitrary sychronization ratio cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.). Shimizu does not show moving the screw backwards while rotating it after completion of the measuring process or the injection process. Imatomi shows that it is known to retract the screw while rotating it (Column 6, lines 20-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to move the screw backwards, as in Imatomi, in Shimizu's injection molding process in order to melt and measure the material more efficiently. Furthermore, Shimizu and Imatomi show the basic process as claimed as discussed above, but do not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent

converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 8, Shimizu and Imatomi show the basic process as claimed as discussed above, but do not show varations of the synchronization of the screw rotation and linear movement. Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the linear speed of the screw (Column 11, lines 56-64), thus preventing any forward movement of material. Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw, encouraging material to be fed in the forward direction. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 10, Imatomi shows the process as claimed as discussed above, including showing that it is known to control an injection molding operation by performing a plasticization/measuring process and an injection process (Column 2, lines 60) and to retract the

screw while rotating it (Column 6, lines 20-31). Imatomi does not show synchronization between the rotation speed of the screw and the backward linear movement of the screw. Shimizu shows that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65), and to define a rotation speed of the screw by dividing the backward speed of the screw by the pitch of the flight of the screw (Column 2, lines 44-57). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized. Furthermore, Imatomi shows that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein.

Regarding Claim 11, Imatomi shows the process as claimed as discussed above, but does not give a formula which gives a value of a rotation speed. Shimizu shows that it is known to define a rotation speed of the screw by dividing the backward speed of the screw by the pitch of

the flight of the screw (Column 2, lines 44-57). Furthermore, the examiner also notes that Shimizu does not explicitly define a synchronization ratio, as used in the formula in Claim 11. However, since the synchronization ratio of Claim 11 cannot alter how the process steps are to be performed to achieve the utility of the invention, it is herein addressed as nonfunctional descriptive material (MPEP 2106 VI.).

Regarding Claim 12, Imatomi shows the process as claimed as discussed above, including showing that it is known that if a synchronization ratio is less that 100%, the screw is rotated more slowly than the backward speed of the screw (Column 11, lines 56-64). Imatomi does not explicitly show that if the synchronization ratio is more than 100%, the screw is rotated faster than then backward speed of the screw. However, since it is an inherent converse operation that with a synchronization ratio less than 100%, the teaching of Imatomi in Column 11, lines 56-64 can be applied as suggesting the nature of an operation with a synchronization ratio of more than 100%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out Imatomi's varying of the synchronization of the screw's rotation speed and linear speed during Shimizu's and Imatomi's molding process in order to achieve better measuring and melting of the material therein. Imatomi does not address a scenario in which the synchronization ratio equals 100%. Shimizu shows that it is known to define a synchronization ratio of a rotation speed of the screw, so that the position of a flight of the screw does not apparently move relative to a speed of the screw (Column 2, lines 58-65). The examiner notes that a specific "synchronization ratio" is not explicitly defined in Shimizu, however, it would have been obvious to one of ordinary skill in the art at the time the invention

was made to assign a value of 100% when the screw rotation and linear movement are perfectly synchronized.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with regard to control of an injector in general:

U.S. Patent 5,023,028 to Kamiguchi et al.

U.S. Patent 5,637,329 to Abrams et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A Fontaine whose telephone number is 703-305-7239. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rick Crispino can be reached on 703-308-3853. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9310 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

JILL L. HEITBRINK
PRIMARY EXAMINER
ART UNIT ~~137~~ 1732

1/9/03

maf
January 9, 2003